

CLAIMS

What is claimed is:

1. A method of stripping an integrated circuit (IC) structure having a photoresist material and an organosilicate glass (OSG) material, comprising:

5 feeding a nitrous oxide (N₂O) gas into a reactor;

generating a plasma in said reactor;

stripping said photoresist; and

generating a high selectivity between said photoresist and said OSG.

10 2. The method of claim 1 wherein said photoresist is an organic photoresist.

3. The method of claim 2 wherein said stripping said photoresist is one of a plurality of steps performed during a dual damascene process.

15 4. The method of claim 3 wherein said stripping of said photoresist is performed in the same reactor used for etching said OSG material.

5. The method of claim 1 further comprising,

providing a via etched into said IC structure;

20 generating an organic plug that occupies said via; and

stripping said organic plug with said N₂O gas.

6. A method of stripping an integrated circuit (IC) structure including a first photoresist layer, a second intermediate layer, and a third organosilicate glass (OSG) layer, comprising:
- feeding a nitrous oxide (N₂O) gas into a reactor;
- 5 generating a plasma in said reactor;
- stripping said photoresist with said plasma;
- generating a high selectivity between said first photoresist layer and said second hardmask layer; and
- generating a high selectivity between said first photoresist layer and said third
- 10 OSG layer.
7. The method of claim 6 wherein said photoresist is an organic photoresist.
8. The method of claim 6 wherein said stripping of said photoresist is performed
- 15 in the same reactor used for etching said OSG layer.
9. The method of claim 6 wherein said stripping said photoresist is one of a plurality of steps performed during a dual damascene process.
- 20 10. The method of claim 6 wherein said second intermediate layer is a cap layer.

11. The method of claim 10 wherein said cap layer is selected from a group consisting of Silicon Dioxide (SiO_2) and Silicon Oxynitride (SiON).

12. The method of claim 6 wherein said second intermediate layer is a hardmask
5 layer.

13. The method of claim 12 wherein said hardmask layer is selected from a group consisting of Silicon Nitride (Si_3N_4), Tantalum Nitride (TaN), Titanium Nitride (TiN), and Silicon Carbide (SiC).

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14. A method of performing a via first etch with an IC structure including a first photoresist layer, a second cap layer, and a third organosilicate glass (OSG) layer, comprising;

15 firstly, etching a via into said second cap layer and said third OSG layer; and
secondly, stripping said first photoresist layer with a nitrous oxide (N_2O) gas.

16. The method of claim 14 further comprising, thirdly, generating an organic plug with said via that occupies part of said third OSG layer.

20 16. The method of claim 15 further comprising, fourthly, etching a trench into said second cap layer and said third OSG layer.

17. The method of claim 15 further comprising, fifthly, stripping said other first photoresist layer and said organic plug with said N₂O gas.

5 18. The method of claim 17 wherein said photoresist is an organic photoresist.

19. The method of 18 wherein said stripping said photoresist is one of a plurality of steps performed during a dual damascene process.

10 20. A method of performing a trench first etch with an IC structure including a first photoresist layer, a second hardmask layer, and a third organosilicate glass (OSG) layer, comprising:

firstly, etching a trench into said second hardmask layer; and
secondly, stripping said first photoresist layer with a nitrous oxide (N₂O) gas;

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21. The method of claim 20 further comprising, thirdly, applying another first photoresist layer for performing a via etch.

20 22. The method of claim 21 further comprising, fourthly, etching a via into said second hardmask layer, and said third OSG layer.

23. The method of claim 22 further comprising, fifthly, stripping said other first photoresist layer with said N₂O gas.
24. The method of claim 23 further comprising, sixthly, generating an organic plug
5 within said via that occupies part of said third OSG layer.
25. The method of claim 24 further comprising, seventhly, etching said trench into
said third OSG layer.
- 10 26. The method of claim 25 further comprising, eighthly, using said N₂O gas to
strip said organic plug.